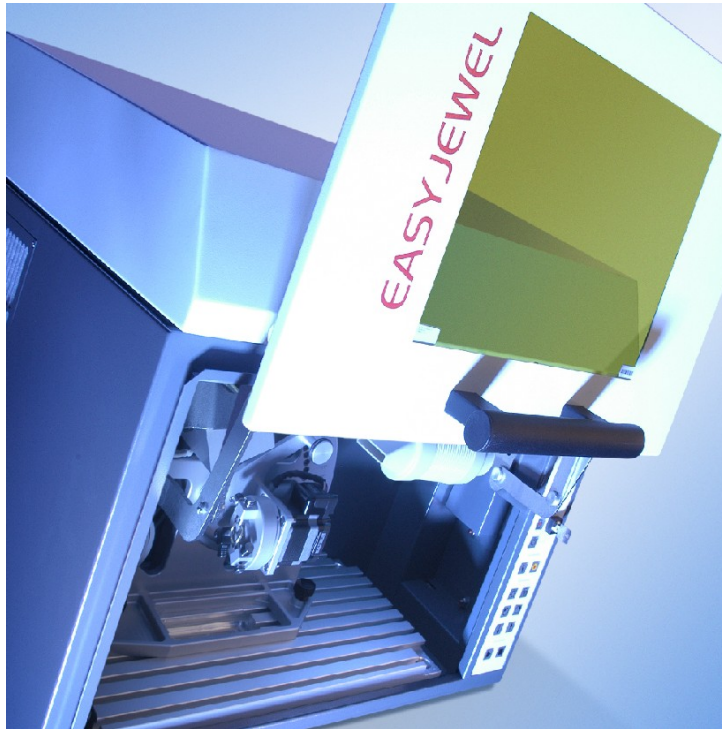


EasyJewel



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1 Technical Details

1.1 System description

ROFIN has managed to develop a compact, operator-friendly, easy-to-handle laser marker: the EasyJewel dedicated to the needs of jewelers and marking of rings and other jewelry.

The diode pumped Rofin-laser source is ideally suited for operations requiring maximum productivity on a wide range of applications on different materials.

The system characteristics incorporate long-term operational effectiveness (low electrical power supply and a thermo-electrical cooling-technology), power stability for superior beam quality and pulse stability (effect on marking-contrast and quality) and maintenance-free and durable end-pumped diode modules.

The laser beam is excellently suitable for various applications in different branches.



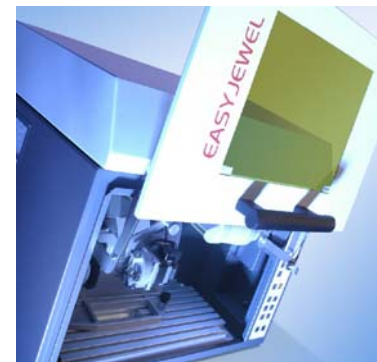
The system corresponds to laser class I.
Wearing laser safety goggles is not necessary.

1.2 Housing

The customer can expect a comfortable, low-maintenance device with a generous, enclosed working area.

The comfortable handling of the laser is emphasized by a positioning help which enables the customer to exactly determine the position Start and End of the marking on the workpiece.

The 110 - 230V connection and the integrated air-cooling ensure quick and easy initial operation without requiring additional devices such as an external cooling.



1.3 Laser source

Type:	Nd:YVO ₄ , diode pumped	
Wavelength:	1064 nm	
Pulse frequency:	programmable, 0 – 80 kHz	
Marking field size	∅ 135 mm	□ 115 × 115 mm for flat field marking
Focal length:	f = 160 mm	
Pilot laser (Diode laser)	630 nm	

1.3.1 Technical Data

Power supply	100 – 240 VAC, +/- 10%, 50/60 Hz
Connection	600 W max.
Dimensions	600 mm x 530 mm x 500 mm (LxWxH)
Weight	approx. 70 kg
Cooling	Thermo-electric; integrated air cooling
Documentation:	on CD

1.3.2 Operating environment

	Operation	Storage	Transportation
Temperature	+15 to +35 °C	-15 up to +50 °C*	-15 up to +50 °C*
Humidity	5% up to 80% r.F. (non condensing)	5% up to 80% r.F. (non condensing)	5% up to 80% r.F. (non condensing)
Mechanical load			Shock- and tilt indicators during transportation

< 2500 m above sea level

Before initial operation the machine must have been stored at a constant room temperature for 24 hours (to avoid condensation) .

1.3.3 Controller

The controlling of the EasyJewel is based on a specific extension-card. This internal interface has been developed especially for laser marking and communicates to all important components of the system (power supply, Q-switch, Galvo-driver, etc.).

1.3.4 Basic Software

VLM based

1.4 Quality and Pre-Acceptance

ROFIN Baasel processing systems are manufactured with the help of state-of-the-art machine tools. All systems are produced in accordance with rules and regulations applying to and meeting current CE regulations:

- VDE 0837 (IEC 825) VDE 0100 VFE 00105
- EN 292 EN60825 EN60204
- Laser safety acc. to UVV VBG93 and 21 CFR

ROFIN Baasel Lasertech has a quality management department according to DIN EN 9001:2000 Certification was done by the Safety Standards Authority in Hamburg, Germany and LGA Nürnberg, Germany.

An acceptance test is carried out prior to shipping. The purpose of this test is to test the systems operation and it's specifications. The customer may – at his own choice and cost – participate this acceptance test.

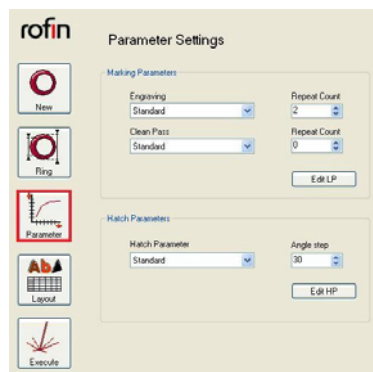
1.5 Operation

1.5.1 Ring Marking

The EasyJewel Software is especially designed to bring out the best results of the Rofin Ring Marking Module (see 1.5.2). With only a few steps it's possible to specify the necessary parameters and to define the layout. Our unique test mode allows the user to verify the result before the actual marking process.

Step 1 – Defining the Ring Geometry

Both inside and outside Marking of a ring is possible by simply clicking on the corresponding button in the User Interface. Only a few parameters, which can be easily measured on the ring – like diameter and width, are necessary to define the surface. The software then automatically calculates the position for the installed axes.



Step 2 – Defining the Material

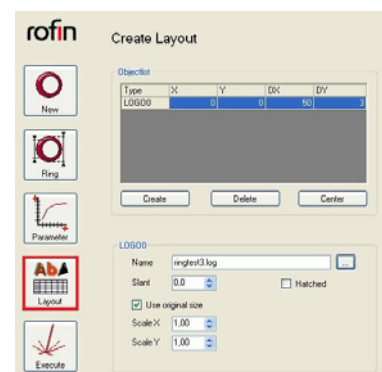
Using our pre-defined material database, it's possible to select all necessary laser parameters with a simple mouse-click. For both marking and cleaning pass a material-keyword can be chosen. To increase the engraving depth, the number of repetitions can be modified also.

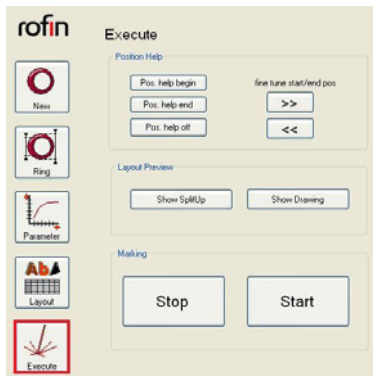
A special feature to reach a high marking quality is the rotating hatch. The fill lines are rotated by a specified angle for each marking pass.

Step 3 – Creating the Layout

Instead of using a complex Graphic program, the EasyJewel software allows the user to create the marking layout with a few simple steps. Any combination of texts and graphics can be used to generate the marking contents.

Texts with different fonts and heights and DXF graphics can be freely scaled and positioned or even automatically arranged and centered. You'll see a WYSIWYG (what you see is what you get) preview of the marking result directly on-screen while creating the layout.





Step 4 – Engraving the Ring

Before actually marking the Ring another unique feature of the EasyJewel helps you get a perfect result. With a built-in camera the engraving area can be monitored on the PC screen. Two buttons allow the user to find the start and the end position of the marking range using a pilot Laser. If a hallmark, assaying or a previous marking is in the way, the ring can be turned from within the user interface without touching it. As soon as you are satisfied with the position in the camera window, a click on “Start” starts the marking process.

1.5.2 Ring Marking Module RMM

The Ring Marking Module is a specially designed module for in - and outside marking of rings (bands).

The RM- Module offers an easy load and unload function. Additionally a unique fixturing device, for rings with irregular outside shapes is included. This allows the operator to position such rings in the centre of the marking area.

The system includes a programmable Z-axis which moves to its reference point automatically by entering the measurements of the ring, in the Ring Marking User Interface.

The possibility to view the start and the end point of the actual marking area is given by a online camera which is a part of the RMM. This function allows the operator to see obstacles (i.e. hallmarks) in the marking area, before the actual marking. A jog function will give the operator the possibility to choose an area w/o obstacles.

To avoid distortions while inside ring marking the User Interface calculates the recommended angle of tilting the rotary (M)-Axis. This angle has to be set manually at the RMM.

The precise rotary (M) - axis is mandatory for high throughput as well as reproducible marking quality.



1.5.3 Motion Systems

The axis system is controlled by stepper motors and has a T-slot-plate for attaching the working piece.

Travel of z-axis	45 mm with RMM
Speed of z-axis	max. 10 mm/s
Repeatability –z-axis	0,1 mm
Clamping range of RMM	Ø 40 mm
Speed of rotary axis	max 120 rpm

1.5.4 Camera Vision system

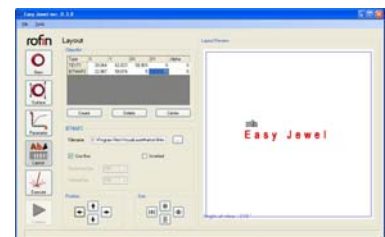
Type
interface

Color with CMOS chip, with diode illumination
USB at customer PC, frame grabber software

1.5.5 Flat Marking

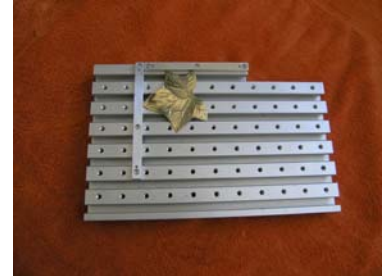
The same easy and intuitional interface can be used to create marking layouts for flat surfaces. With only a few mouse clicks the user can combine different texts and bitmaps. Each item can be freely moved and sized. To make it even more convenient, the software takes care of the necessary hardware setup after specifying the workpiece height.

The function for the data Import is the same as the one for the RMM.



1.5.6 Flat Marking Module (FMM)

The unique EasyJewel fixture for flat marking enables the user to adapt new parts very easily. It also guarantees a smooth handling of the process even with larger quantities.



1.6 Computer System Requirements

The Computer system is not included in the scope of our quotation and has to be provided by the customer.

The system requirements are as follows

1000 MHz and USB 2.0

Monitor resolution: Minimum: 1024x768 - Recommended: 1280x1024

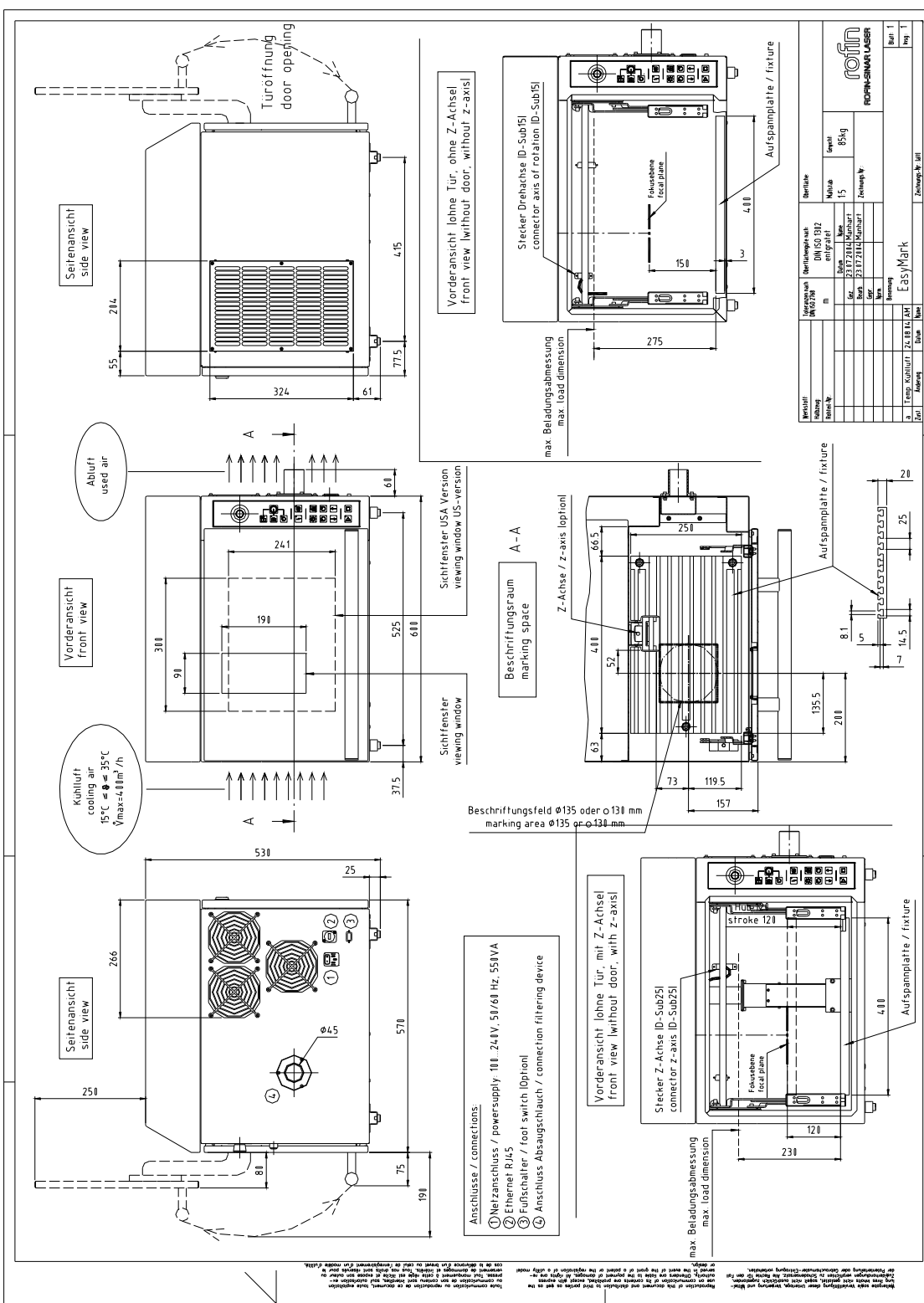
Main memory: \geq 512 MB

Free hard disk space: \geq 300 MB

Operating system: Windows XP

Note: The system is not compatible with PC's using Vista as operating system

1.7 Drawing



Technical drawings are subject to change.